

CLAIMS

What is claimed is:

1. A method for manufacturing a magnetic write element for use in a data
2 recording system, comprising the steps of:
 - 3 a. providing a first pole having a first and a second end and constructed of a
4 magnetic material;
 - 5 b. depositing a dielectric write gap material layer over said first pole, said
6 dielectric write gap material layer extending to said first end of said first
7 pole and being formed so as to leave a portion said first pole uncovered at
8 said second end of said first pole to provide a back-gap;
 - 9 c. depositing a mask material onto said seed layer;
 - 10 d. patterning a coil pattern in said mask material using a photolithographic
11 process;
 - 12 e. selectively removing a portion of said patterned mask material to produce
13 a recess in said mask material in said pattern of said coil;
 - 14 f. forming a trench in said mask material adjacent said coil pattern, said
15 trench having a depth that is shallower than that of said coil pattern recess;
 - 16 g. baking said mask material;
 - 17 h. depositing an electrically conductive coil into said coil pattern recess;
 - 18 i. removing said mask material;
 - 19 j. depositing a coil insulation layer;
 - 20 k. curing said coil insulation layer; and
 - 21 l. forming a second pole constructed of a magnetic material, said second
22 pole contacting said first pole at said back-gap, and being separated from
23 said first pole at said first end by said write gap material layer.

1 2. A method as recited in claim 1 wherein said electrically conductive coil is
2 electroplated and further comprising the steps of:
3 a. before depositing said mask material, depositing a thin, electrically
4 conductive seed layer;
5 b. after depositing said electrically conductive coil, removing said seed layer.

1 3. A method as recited in claim 1 wherein said coil material and said seed layer
2 are copper.

1 4. A method as recited in claim 1 wherein said trench extends around said coil
2 patterned recess in said mask.

1 5. A method as recited in claim 1 further comprising two or more of said
2 trenches.

1 6. A method as recited in claim 1 wherein said trench has a width of 0.3 to 0.5
2 microns.

1 7. A method as recited in claim 5 wherein said trenches are spaced roughly 0.5
2 microns apart.

1 8. A method as recited in claim 1 wherein said trench is spaced at least 0.8
2 microns from the outermost portion of said coil patterned recess in said mask
3 material.

1 9. A method as recited in claim 1 wherein said coil has a pitch of at least 0.4
2 microns.

1 10. A method as recited in claim 1 wherein said coil patterned recess in said mask
2 material extends through said mask material, and wherein said trench does not
3 extend through said mask material.

1 1.1 A magnetic write element constructed according to the process of claims 1, 2,
2 3, 4, 5, 6, 7, 8, 9, or 10.

3 a. a housing;

4 b. a motor connected with said housing;

5 c. a spindle driven by said motor;

6 d. a magnetic disk, support by said spindle for rotation thereabout;

7 e. an actuator connected with said housing;

8 f. a head supported by said actuator proximal to a surface of said disk;

9 g. a magnetic read element disposed on said head;

10 h. a magnetic write element disposed on said head, said write element being
11 constructed by the method of claims 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10.